Residual Chlorine Improvement in Woodhill Water Supply Zone

Denver Pollock
Problem Definition

- Low Residual Chlorine in network
- Presence of E.coli in reservoirs
Objectives

- Compliance with the Australian Drinking Water Guidelines
  - Minimum chlorine residual of 0.2 mg/L
  - Maximum chlorine residual of 5 mg/L
- Logan City Council - Aesthetics
  - Maximum chlorine residual of 1 mg/L on average day
  - Maximum chlorine residual of 1.5 mg/L on 3 consecutive MD
Methodology

• Collect network data
• Build and calibrate water quality model
• Implement improvement options to model
Options Development

• Reducing Chlorine Decay
  • Option 1 – Pipe Quality Improvement to Reduce Decay
  • Option 2 – Pressure Reduction to Reduce Decay
  • Option 3 – Passive Mixing in Reservoirs to Reduce Stratification
  • Option 4 – Active Mixing in Reservoirs to Reduce Stratification

• Improving Network Operation
  • Option 5 – Changed Reservoir Operation Levels to Reduce Bulk Decay
  • Option 6 – Changed Starting Times for Pumps to Decrease Water Age
  • Option 7 – Change Pump Configuration to Decrease Water Age
  • Option 8 – Change Speed of Pumps to Decrease Water Age

• Boosting Chlorine Residuals
  • Option 9 – Increasing Existing Chlorine Dosing on Woodhill Reservoir
  • Option 10 – Recirculation Chlorine Boosting
  • Option 11 – Dosing on Woodhill Reservoir Outlet to Stabilise Chlorine Residual
  • Option 12 – Dosing at Razorback and Mundoolun WPS to Boost Chlorine
  • Option 13 – Dosing at Razorback and Mundoolun Reservoir to Boost Chlorine
Scenario A - Base Case (Max Chlorine)
Scenario B – Non-Infrastructure (Max Chlorine)
Scenario C – Woodhill Infrastructure (Max Chlorine)
Scenario D1 – Network Infrastructure (Max Chlorine)
Scenario D2 – Network Infrastructure (Max Chlorine)
Conclusions

Non-Infrastructure

Scenario A (Base Case) 29%
Scenario B (Woodhill Non-Infrastructure Option) 41%
Scenario C (Woodhill Infrastructure Option) 41%
Scenario D1 (Network Infrastructure Option – pump station boosting) 89%
Scenario D2 (Network Infrastructure Option – reservoir inlet boosting) 93%

Infrastructure

Scenario | Residents Receiving Chlorinated Water
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Scenario A (Base Case) | 29%
Scenario B (Woodhill Non-Infrastructure Option) | 41%
Scenario C (Woodhill Infrastructure Option) | 41%
Scenario D1 (Network Infrastructure Option – pump station boosting) | 89%
Scenario D2 (Network Infrastructure Option – reservoir inlet boosting) | 93%
Questions